

**Remarks**

This is responsive to the Office Action mailed on September 21, 2006.

Claims 1 and 52-59 are pending for examination, with claim 1 being an independent claim. All claims have been amended. Claim 1 has been amended to clarify the following. First, the claim now recites that the three dimensional structure used is that of the conserved active site of RRF protein, and the compound designed or selected is a compound capable of binding to the conserved active site of the RRF protein. Second, the claim has been clarified to indicate that the structure is that of a functional RRF protein, i.e., one which protein binds ribosomal RNA and recycles ribosomes, and therefore not a homology model or other variant. Third, the conserved active site used for the three dimensional structure comprises Arginine residues at positions 110, 129 and 132 according to Table 8. These amino acids were identified as being part of the active site in the specification at page 11, lines 15-17; page 17, lines 18-20; page 21, lines 4-11; page 48 (Table 5); and in claim 1 as originally filed. Claims 52-59 have been amended for clarification of typographical errors. No new matter has been added.

**Sequence Compliance**

The Examiner indicated that the application failed to comply with the sequence rules due to the recitation in Table 8 of an amino acid sequence.

Applicant has amended the specification to indicate that the amino acid sequence of RRF producing the structure coordinates in Table 8 is SEQ ID NO:1. No new matter has been added by this amendment.

Accordingly, Applicant respectfully requests withdrawal of the objection to the specification based on the sequence rules.

**Rejections Under 35 U.S.C. 112, First Paragraph**

A. The Examiner rejected claims 1 and 52-59 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Specifically, the Examiner indicated that the broadest reasonable interpretation of the three-dimensional structure recited in the claims includes homology models. The Examiner cites to a part of the specification to support this interpretation.

Applicant respectfully disagrees that the broadest reasonable interpretation of the claims would include homology models. In contrast to the disclosure of the specification, the claims are not so directed. The section of the specification identified by the Examiner requires use of more than what is claimed. It specifically requires the use of molecular substitution, which Applicant is not claiming.

Nevertheless, to expedite prosecution, Applicant has amended the claim to recite that the three-dimensional structure used in the specification is that of the conserved active site of functional RRF protein, which protein binds ribosomal RNA and recycles ribosomes, and that the conserved active site comprises Arginine at positions 110, 129 and 132 according to Table 8. Clearly one skilled in the art would recognize that Applicant invented the use of this conserved active site three dimensional structure. See, for example, the passage at page 21, lines 4-23, which clearly states the use of the structure to design or select compounds that inhibit RRF by binding to the active site of RRF.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

B. The Examiner rejected claims 1 and 52-59 under 35 U.S.C. 112, first paragraph, as lacking enablement.

The Examiner acknowledged that the specification is enabling for the use of a three-dimensional structure having the structural coordinates of SEQ ID NO:1 as listed in Table 8. (Office Action, first paragraph of section [8], spanning pages 5-6.) Applicant respectfully requests reconsideration because the claims now recite what the Examiner has acknowledged to be enabling. Applicant has further constrained the claim to require that the three dimensional structure of the conserved active site contain Arginines at positions 110, 129 and 132 according to Table 8, and that the RRF from which the conserved active site structural information is drawn be functional, i.e., that the RRF binds ribosomal RNA and recycles ribosomes. These Arginine residues are acknowledged to be important for active site function. Thus, the claims do not cover the use of homology models or other variants of RRF.

As in the written description rejection, the Examiner has interpreted the claims as encompassing the use of “homology models”. Although Applicant respectfully disagrees with the Examiner’s interpretation, to expedite prosecution and facilitate allowance of the claims Applicant has amended the claims to clarify that the claims are not directed to the use of homology models, as noted above.

As the Examiner acknowledges, Applicant’s specification enables methods as now claimed. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

### **Rejections Under 35 U.S.C. § 103**

The Examiner rejected claims 1 and 52-59 under 35 U.S.C. § 103 as unpatentable over Wilson et al. (U.S. Patent 5,856,116) in view of Kaji et al. (*Biochem Biophys Res Comm* 250:1-4, 1998) and *In re Gulack* 217 USPQ 401 (Fed. Cir. 1983). Applicant respectfully traverses the rejection and requests reconsideration.

The Examiner has alleged that the atomic coordinates provided in Table 8 are merely descriptive matter that is not functional. The atomic coordinates of Table 8 cannot be “merely

descriptive” because these coordinates represent an actual three dimensional structure to the skilled person, not just instructions for a computer to make a three-dimensional structure. A three-dimensional structure of sufficient accuracy to design or select a compound capable of binding to the active site of RRF protein can be made with or without the use of a computer. The use of the coordinates by the appropriate computer software merely speeds up the representation of the three dimensional structure of the protein as demonstrated in the specification. Without the use of the coordinates, such a structure could not be produced, whether by hand or by computer. Thus, far from being “merely descriptive”, the claimed invention provides for the use of the structure of RRF.

The coordinates are the same as a chemical formula, a newly discovered compound called RRF, and thus useful in the same way as a chemical formula for designing new compounds. The invention is analogous to the elucidation of the structure of a chemical compound. Just as conventional chemical notation provides for certain bonds and structural features of a compound, the structure provided by Applicant provides the skilled person with all the knowledge necessary to visualize the structure of RRF, and more particularly of the conserved active site of RRF, which correspondingly allows the skilled person to design or select compounds that bind to and thereby inhibit the active site of RRF in general.

The Examiner’s use of the In re Gulack case therefore is inapplicable. While the structural coordinates can be used by a computer to draw the structure of the conserved active site of RRF proteins, that is not necessary. Applicant’s specification provides the structure; the skilled person can produce it by placing the atoms of the structure into a three dimensional space according to the coordinates provided in Table 8. Thus, the coordinates are anything but merely descriptive; they represent the actual structure of a protein that was not previously available through teaching or suggestion.

The claims recite employing a three-dimensional structure of the conserved active site of RRF, which contains Arginines at positions 110, 129 and 132. The three-dimensional structure of the conserved active site is not obvious in view of the cited references because prior to

Applicant's elucidation of the structure of the conserved active site, no such structure could have been made.

Applicant's structure was neither taught nor suggested by the prior art. The cited references simply do not provide all of the elements of the claimed invention. The Wilson patent, while describing atomic coordinates of interleukin-1 $\beta$  converting enzyme, does not provide the element of the three-dimensional structure of the conserved active site of RRF. The Kaji article is a review article that may suggest targeting RRF protein, but it does not provide any structural information about the conserved active site of RRF protein and therefore does not contribute any element of the structural element of the claims. Further, In re Gulack provides no element of the claimed invention. In summary, the elements of the claimed invention are not taught or suggested by the prior art and therefore the Examiner has failed to make a *prima facie* case of obviousness.

In addition, the person of ordinary skill in the art would not have had a reasonable expectation of success, based on the Wilson patent combined with the Kaji reference in view of In re Gulack. In fact, such a person would have had no expectation of success in carrying out the claimed method. Without the structure of the conserved active site of RRF provided by Applicant, it is beyond doubt that one skilled in the art could not practice the claimed invention. On this additional basis, the Examiner failed to make a *prima facie* case of obviousness.

Accordingly, in view of the foregoing arguments and the amendment of the claims, Applicant respectfully requests reconsideration and withdrawal of the rejection of the claims as unpatentable over Wilson et al. in view of Kaji et al. and In re Gulack.

**CONCLUSION**

In view of the foregoing amendments and arguments, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,  
*Kaji, et al., Applicant*

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